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10/541,704	07/08/2005	Norio Ohtake	F-8744	9784

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EXAMINER	
RAPHAEL, COLLEEN M	
ART UNIT	PAPER NUMBER
1724	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,704	OHTAKE ET AL.	
	Examiner	Art Unit	
	COLLEEN M. RAPHAEL	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2011* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 10-21 are current in the application. Claims 10-21 are currently under examination. Claims 1-9 were cancelled by Applicant.

Drawings

2. The drawings were received on April 12, 2011. Figs. 1 and 2 are accepted. Fig. 3 is not accepted. Fig. 3 still does not clearly show how the secondary side piping and the primary side piping are connected to part 3. It is also unclear to the Examiner what the dotted lines (that are superimposed over Fig. 3) are meant to separate and delineate. The Examiner is uncertain whether the dotted lines are meant to delineate the primary side piping from the secondary side piping, or whether there is an entirely different purpose to the dotted lines.

Specification

3. The substitute specification filed April 12, 2011 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: it is unclear from Fig. 3 and the text of the specification where the secondary side piping 39 is located and how it is connected to the cell 3, and where the primary side piping 37 is located and how it is connected to the cell 3 (p. 13, lines 20-21 and p. 14, lines 1-3). In Fig. 3, part 39 is connected to V1, not part V2, and part 37 is located between part AV3 and part AV4, not between parts 11 and AV1. It is unclear to the Examiner which part (V1 or V2) is the introducing valve at the glass cell 3.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 10-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s),

at the time the application was filed, had possession of the claimed invention. It is unclear to the Examiner from Fig. 3 and the text of the specification where the secondary side piping 39 is located and how it is connected to the cell 3, and where the primary side piping 37 is located and how it is connected to the cell 3 (p. 13, lines 20-21 and p. 14, lines 1-3).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 10-18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan et al (US 5,934,103) in view of Shino et al (US 5,039,500).

8. Regarding claim 10, Ryan teaches a method of producing nuclear spin polarized xenon gas comprising: heating a glass cell filled with solid rubidium and xenon in the pressure reducing state of being absent in oxygen to produce therein gaseous xenon and a mixture of gas and liquid phases of rubidium (col. 3, lines 56-64), irradiating with a laser beam the gaseous xenon and the mixed-phase rubidium that is in the glass cell and is produced from the solid xenon and solid rubidium, and applying a magnetic field to the irradiated gaseous xenon and mixed- phase rubidium in the glass cell to achieve the nuclear spin polarized xenon gas. (col. 4, lines 14-29). It is inherent that the glass cell of Ryan is oxygen-free, as the rubidium (an alkali metal) is in elemental form. See MPEP § 2112(II).

9. Ryan does not explicitly teach that the xenon is solidified in the glass cell.

10. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 11, Ryan teaches the method of claim 10, further comprising: removing nuclear spin polarized xenon gas from the glass cell; and during said removing, introducing xenon gas into the glass cell in a manner that maintains fixed pressure within the glass cell. (col. 3, lines 65-67 and col. 4, lines 1-13)

Regarding claim 20, Ryan teaches the method of claim 11, further comprising: after said removing and introducing, isolating the glass cell to prevent entry or exit of contents. (col. 6, lines 3-15) Note that mere repetition of a step (e.g. repeating the steps of removing and introducing) until a threshold is met is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Ryan does not explicitly teach cooling the isolated glass cell sufficiently to solidify xenon gas content.

11. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 12, Ryan teaches the method of claim 11, wherein said xenon gas is introduced from a xenon gas supply device into the glass cell along primary side piping, located between the xenon gas supply device and a first air operate valve, and second side piping, located between the first air operate valve and the glass cell; and further comprising: replacing the xenon gas supply device while the glass cell is coupled to the secondary side piping and to outlet piping; vacuuming the primary side piping (col. 6, lines 3-14); and pressurizing the primary side piping with nitrogen gas. (Fig. 3, col. 5, lines 42-65) Note that mere repetition of a step until a threshold is met (e.g. the vacuuming and pressurizing are repeated automatically at least three times after the replacing) is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Regarding claim 13, Ryan teaches a method for producing nuclear spin polarized xenon gas wherein said xenon gas is introduced from a xenon gas supply device into the glass cell along primary side piping, located between the xenon gas supply device and a first air operate valve, and second side piping, located between the first air operate valve and the glass cell; wherein nuclear spin polarized xenon gas is removed from the glass cell through outlet piping, and wherein branch piping connects between a valve at the outlet piping and a second air operate valve coupled to the primary side piping, and further comprising: replacing the glass cell with another glass cell filled with solid rubidium and solid xenon; opening the first and second air operate valves and the valve at the outlet piping; vacuuming the primary side piping, secondary side piping, and branch piping; pressurizing the primary side piping, secondary side piping, and branch piping with nitrogen gas; and closing the first and second air operate valves and the valve at the outlet piping (col. 6, lines 15-34). Note that mere repetition of a step (e.g. the opening, vacuuming, pressurizing, and closing are repeated automatically at least three times after the replacing) until a threshold is met is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Regarding claim 14, Ryan teaches filled with solid rubidium and solid xenon in a vacuum from glass encased rubidium located in a chamber, the chamber coupled to the glass cell by piping, the method comprising; exhausting the piping with a vacuum generator; breaking the glass that encases the rubidium; heating the rubidium, the piping and the glass cell causing rubidium to enter into a gaseous state, wherein the gaseous rubidium enters the glass cell; cooling the glass cell causing rubidium to precipitate as a solid within the glass cell; filling the glass cell having solid rubidium with xenon gas; and isolating the filled glass cell. (col. 6, lines 14-34)

Ryan does not teach cooling the isolated glass cell causing xenon within the glass cell to solidify and the glass cell to assume a pressure reducing state.

12. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 15, Ryan teaches an apparatus for producing nuclear spin polarized xenon gas, comprising: means for heating a glass cell filled with solid rubidium and solid xenon in the pressure reducing state of being absent in oxygen to produce therein gaseous xenon and a mixture of gas and liquid phases of rubidium; (col. 3, lines 56-64) and a laser projecting a beam into the glass cell for irradiating the gaseous xenon and the mixed-phase rubidium; and means for applying a magnetic field to the irradiated gaseous xenon and mixed-phase rubidium to achieve the nuclear spin polarized xenon gas. (col. 4, lines 14-29). It is inherent that the glass cell is oxygen-free, as the rubidium (an alkali metal) is in elemental form. See MPEP § 2112(II).

Ryan does not explicitly teach that the xenon is solidified in the glass cell.

13. Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the apparatus of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing in the apparatus of Ryan. (see Shino et al, col. 2, lines 35-43).

Regarding claim 16, Ryan teaches the apparatus of claim 15, further comprising: means for introducing xenon gas while taking out the produced nuclear spin polarized xenon gas; and pressure regulating means for maintaining a fixed pressure within the glass cell while xenon gas is being introduced and nuclear spin polarized xenon gas is being taken out. (col. 3, lines 65-67 and col. 4, lines 1-13)

Regarding claim 21, Ryan teaches the apparatus of claim 16, further comprising: means for isolating the glass cell to prevent entry or exit of contents. (Fig. 3, parts 78, 80, 82, 84, and 66-74, col. 6, lines 3-15)

Ryan does not explicitly teach a means for cooling the isolated glass cell sufficiently to solidify xenon gas content.

Shino et al teaches a means for cooling xenon gas in a system sufficiently to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the apparatus of Ryan by adding a means for cooling xenon gas sufficiently to solidify it as taught by Shino et al, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon. (see Shino et al, col. 2, lines 35-43).

Regarding claim 17, Ryan teaches the apparatus of claim 15, further comprising: a xenon gas supply device; a first air operate valve; primary side piping coupling the xenon gas supply device to the first air operate valve; secondary side piping coupling the glass cell to the first air operate valve (Fig. 3, parts 44b, 66, 98, col. 5, lines 42-65); pressure regulating means (Fig. 3, parts 44a, 44b, 60b, 62, col. 5, lines 42-65); a second air operate valve coupled to the primary side piping (Fig. 3, parts 82, 70, 78, col. 5, lines 42-65 and col. 6 lines 1-34); outlet piping coupling the glass cell to an outlet; a third valve coupled to the outlet piping; and branch piping coupled to the second air operate valve, the branch piping having a first branch coupled to the third valve and having a second branch coupled to a vacuum generator (Fig. 3, part 86, col. 6 lines 1-14).

Regarding claim 18, Ryan teaches an apparatus of a glass cell having solid rubidium and xenon in a vacuum therein, comprising: a chamber housing glass encased rubidium; piping coupling the chamber and a glass cell (Fig. 3 parts 94, 96, 98, col. 6 lines 14-34); a vacuum generator coupled to the piping for exhausting the piping (Fig. 3, part 86, col. 6 lines 1-14); means for breaking the glass that encases the rubidium (Fig. 3, part 94a, col. 6 lines 14-34); means for heating the rubidium, the piping and the glass cell causing rubidium to enter into a gaseous state, wherein the gaseous rubidium enters the

glass cell (Fig. 3, part 104, col. 6 lines 14-34); means for cooling the glass cell causing rubidium to precipitate as a solid within the glass cell (Fig. 3, part 88, col. 6, lines 1-14); means for filling the glass cell having solid rubidium with xenon gas. (cite)

14. Ryan does not explicitly teach that the means for precipitating metal rubidium is attached to the glass cell. However, it would be a mere rearrangement of parts to move the cold trap such that it was attached to the glass cell, because this would allow trapping of the rubidium before any gaseous rubidium passed into the gas flow loop. See MPEP 2144.04 (VI)(C); *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)

15. Shino et al teaches a means for cooling the filled glass cell causing xenon within the glass cell to solidify and the glass cell to assume a pressure reducing state (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the apparatus of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing in the apparatus of Ryan. (see Shino et al, col. 2, lines 35-43).

16. Claims 10-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryan et al (US 5,934,103) in view of Raftery et al, "High-Field NMR of Adsorbed Xenon Polarized by Laser Pumping," Phys. Rev. Lett. 66 (5), pp. 584-587 (hereinafter Raftery et al).

Regarding claim 10, Ryan teaches a method of producing nuclear spin polarized xenon gas characterized in that a glass cell having solid rubidium and filled with xenon in the pressure reducing state of being absent in oxygen (col. 3, lines 56-64) is heated to be gas xenon and gas-liquid mixed rubidium, to which a magnetic field is applied to irradiate a laser beam. (col. 4, lines 14-29). It is inherent that the glass cell is oxygen-free, as the rubidium (an alkali metal) is in elemental form. See MPEP § 2112(II).

Ryan does not explicitly teach that the xenon is solidified in the glass cell.

Raftery et al teaches introducing xenon gas into a system and cooling it in order to adsorb it onto a surface. (right col., p. 585, para. 2, lines 1-18). Raftery et al teaches that this allows measurement of optically-pumped xenon with high enhancement (left col., p.585, para. 1, lines 11-12).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium as taught by Raftery before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow measurement of optically-pumped xenon with high enhancement. (see Raftery et al, left col., p.585, para. 1, lines 11-12).

Regarding claim 11, Ryan teaches a method for the controlled flow of xenon gas, wherein the xenon gas may be introduced so as to maintain fixed pressure while taking out the nuclear spin polarized xenon gas produced by irradiating the laser beam. (col. 3, lines 65-67 and col. 4, lines 1-13)

Regarding claim 12, Ryan teaches a method for producing nuclear spin polarized xenon gas wherein in replacing a xenon gas supply device, the xenon gas supply device side is made to be a primary side through a first air operate valve, and the xenon gas introducing side of the glass cell is made to be a secondary side, (Fig. 3, col. 5, lines 42-65) and vacuuming of the primary side piping and pressurization-leaving by nitrogen gas are possible. (col. 6, lines 3-14) Note that mere repetition of a step until a threshold is met is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Regarding claim 13, Ryan teaches a method for producing nuclear spin polarized xenon gas wherein in replacing the glass cell, vacuuming of piping from the primary side piping, the secondary side pipe and piping to a valve on the polarized xenon gas take-out side communicated through a second air operate valve with the primary side pipe (col. 6, lines 15-34). Note that mere repetition of a step until a threshold is met is obvious. See *Perfect Web Technologies v. InfoUSA*, 587 F.3d 1324, 1329 (Fed. Cir. 2009)

Regarding claim 14, Ryan teaches a method of producing a glass cell having solid rubidium and xenon filled in vacuum characterized in that a chamber housing therein rubidium filled into a glass vessel and said glass cell are connected so that they are communicated by piping, said piping is exhausted by a

vacuum generator, after which a glass vessel filled with rubidium is broken to heat metal rubidium, piping and glass cell, rubidium of gas is made present within the piping and glass cell, then said glass cell is cooled, metal rubidium is precipitated as a solid into the cooled portion, xenon gas is introduced into the glass cell and closed. (col. 6, lines 14-34)

Ryan does not teach that the glass cell is cooled to solidify xenon within the glass cell.

Raftery et al teaches introducing xenon gas into a system and cooling it in order to adsorb it onto a surface. (right col., p. 585, para. 2, lines 1-18). Raftery et al teaches that this allows measurement of optically-pumped xenon with high enhancement (left col., p.585, para. 1, lines 11-12).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Ryan by solidifying (condensing) the xenon onto the solid rubidium, because this would allow measurement of optically-pumped xenon with high enhancement. (see Raftery et al, left col., p.585, para. 1, lines 11-12).

Regarding claim 15, Ryan teaches an apparatus for producing nuclear spin polarized xenon gas, comprising a means for heating a glass cell having solid rubidium and xenon filled in the pressure reducing state of being absent in oxygen (col. 3, lines 56-64) to be gas xenon and gas-liquid mixed rubidium, and means for applying a magnetic field to the glass cell to irradiate a laser beam. (col. 4, lines 14-29). It is inherent that the glass cell is oxygen-free, as the rubidium (an alkali metal) is in elemental form. See MPEP § 2112(II).

Ryan does not explicitly teach that the xenon is solidified in the glass cell.

Raftery et al teaches introducing xenon gas into a system and cooling it in order to adsorb it onto a surface. (right col., p. 585, para. 2, lines 1-18). Raftery et al teaches that this allows measurement of optically-pumped xenon with high enhancement (left col., p.585, para. 1, lines 11-12).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the apparatus of Ryan by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow measurement of optically-pumped xenon with high enhancement. (see Raftery et al, left col., p.585, para. 1, lines 11-12).

Regarding claim 16, Ryan teaches an apparatus comprising a means for the controlled flow of xenon gas, wherein the xenon gas may be introduced so as to maintain fixed pressure while taking out the nuclear spin polarized xenon gas produced by irradiating the laser beam. (col. 3, lines 65-67 and col. 4, lines 1-13)

Regarding claim 17, Ryan teaches an apparatus wherein a xenon gas supply device side is made to be a primary side piping through a first air operate valve, piping extended up to a valve for introducing xenon gas into a glass cell is made to be a secondary side piping (Fig. 3, parts 44b, 66, 98, col. 5, lines 42-65), branched pipings connected to said primary side piping through a second air operate valve (Fig. 3, parts 82, 70, 78, col. 5, lines 42-65 and col. 6 lines 1-34), one of said branched pipings reaching a vacuum generator (Fig. 3, part 86, col. 6 lines 1-14) and the other reaching a valve on the xenon gas taking-out side of said glass cell (Fig. 3, part 90, col. 6 lines 1-14), and pressure regulating means for regulating pressure introduced into the glass cell is provided on the primary side piping. (Fig. 3, parts 44a, 44b, 60b, 62, col. 5, lines 42-65).

Regarding claim 19, Raftery teaches that said heating, irradiating, and applying produce a highly concentrated, spin-polarized xenon gas in the glass cell, and wherein output from the glass cell may be used in an NMR/MRI process without first being frozen. (p. 585, right col., para. 2, lines 1-7)

Double Patenting

17. A terminal disclaimer was filed on April 12, 2011, but was not accepted because 35 USC 155-156 do not define the term of the patent. The language should instead read 35 USC 154 and 173.

18. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would

have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

19. Claims 10-17 and 19-21 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 7,541,051 B2 in view of Shino et al (US 5,039,500). Shino et al teaches introducing xenon gas into a system and cooling it in order to solidify it. (col. 2, lines 3-10). Shino et al teaches that this allows separation of xenon from impurities such as krypton, and production of high-purity xenon. (col. 2, lines 35-43).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method and apparatus of the '051 patent by solidifying (condensing) the xenon onto the solid rubidium before heating the xenon and rubidium to produce a mixture of gaseous rubidium and xenon, because this would allow separation of xenon from impurities such as krypton, and production of high-purity xenon for further processing by the method and apparatus of the '051 patent. (see Shino et al, col. 2, lines 35-43).

Claim 18 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 7,541,051 B2 in view of Ryan et al (US 5,934,103). Ryan et al teaches an apparatus comprising a glass cell having solid rubidium and xenon filled in vacuum, where diode laser arrays are used as the pumping laser. (col. 2, lines 4-14) Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the '051

patent by using the solid rubidium as a rubidium source as taught by Ryan, because this would enable the use of diode laser arrays as the pumping laser. (see Ryan et al, col. 2, lines 4-14)

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,617,860 (Method and system for producing polarized .sup.129 Xe gas); US 5,809,801 (Cryogenic accumulator for spin-polarized xenon-129); US 5,860,295 (Cryogenic accumulator for spin-polarized xenon-129); US 6,079,213 (Methods of collecting, thawing, and extending the useful life of polarized gases and associated accumulators and heating jackets); US 6,085,743 (Polarized gas delivery system/method); US 6,241,966 B1 (Magnetic resonance imaging using Hyperpolarized noble gases); US 6,318,092 B1 (Alkali metal hybrid spin-exchange optical pumping); US 6,651,459 B2 (Hyperpolarization of a gas); US 6,666,047 B1 (High pressure polarizer for hyperpolarizing the nuclear spin of noble gases); US 6,942,467 B2 (UHV compatible lead through, device and procedure for highly effective production of nuclear spin polarized 3He at high polarization).

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLLEEN M. RAPHAEL whose telephone number is (571)270-5991. The examiner can normally be reached on Monday-Friday, 9:30 a.m. to 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith D. Hendricks can be reached on (571)272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. R./
Examiner, Art Unit 1724
July 1, 2011

/Keith D. Hendricks/
Supervisory Patent Examiner, Art Unit 1724